

Mission Summary
990913H Hurricane Floyd
Synoptic Surveillance Mission

Scientific Crew (42RF)

Chief Scientist	Michael Black
GPS Dropsonde	P. Dodge/Bob Black
Workstation/Radar	Peter Dodge
Step Frequency (SFMR)	Jim Carswell/Eric Uhlhorn

Aircraft Crew (42RF)

Pilots	Taggart, Tennesen, O'Mara
Flight Director	Stan Czyzyk
Navigators	Newman
Systems Engineer	Jim Roles/Sean McMillan
AVAPS Operator	Carlos Gonzales

Mission Briefing:

An NHC-tasked, two-aircraft synoptic surveillance mission (N42RF and N49RF) was planned for 13 September 1999, the third such flight in a row. Additionally, N43RF, was scheduled to conduct a research mission in the inner core region of Hurricane Floyd. N49RF, would depart from Opa Locka airport, Miami at 1730 UTC and fly to the northeast covering the oceanic areas of north and west of Hurricane Floyd, and return to Miami. N42RF, after recovering the night before in St. Croix USVI, would also takeoff at 1730 UTC heading west on the south side of Hispaniola, turn northward through the Mona passage, fly a figure four pattern through Floyd's center, finish the pattern north of Cuba, and land at MacDill AFB, Florida. [Figure 1](#) shows the planned flight tracks of both N43RF and N49RF aircraft. N42RF was to release 16 dropsondes along the track with additional eye and eyewall drops to be decided upon in flight. During the figure 4, N42RF would descend to 14,000 ft. altitude to avoid icing problems and then climb back to max. altitude for the rest of the mission. Floyd was forecast to remain an intense Category 4 storm, with a MSLP of 921 mb and maximum winds of 135 kt. The hurricane was forecast to be near 24° N, 72° W, in the east-central Bahamas. Hurricane Floyd was continuing on a westward track and posed a severe threat to Florida and the southeast U. S. coast. NHC was forecasting Floyd to turn toward the northwest before reaching Florida. Data from these flights might help to pinpoint the location and timing of this change in Floyd's track.

Mission Synopsis:

Takeoff from St. Croix was at 1730 UTC and we started releasing dropsondes at 1820 UTC. At 2200 UTC, the WP-3D descended to 14,000 ft. to begin the figure four pattern near the center of Hurricane Floyd. The lower-fuselage (LF) radar indicated that Floyd was a mature storm with a classic concentric eyewall structure ([Fig. 2](#)). At this time, the outer eyewall of Floyd had just crossed the island of San Salvador in the Bahamas. The eye had contracted to 20 km radius compared to 25 km radius the day before. The outer eye wall was well formed appearing as a continuous ring of high reflectivity at ~90 km radius. A GPS sonde was released in the northern,

outer eyewall at 2242 UTC. Heading to the eye of Floyd from the north, we entered the northern eyewall at 2255 UTC, dropping 2 sondes. The first failed to record a launch-detect, resulting in a failure, and the second sonde recorded partial winds. Maximum flight-level winds were about 120 kts, about 15 kts weaker than observed the day before. At 2300 UTC, N42RF fixed the center at 22.5° N, 73.9° W. Dropsondes in the eye were not released on this flight since both N43RF and the Air Force plane would be releasing eye drops. The eye was not as clear as on the flight a day earlier, with high and low cloud partially obscuring the sky and sea surface. The WP-3D continued through the southern eyewall, turned downwind to the northeast before reaching the outer eyewall and made a final pass through Floyd's eye from east to west. Flight-level winds were 100, 115, and 120 kts in the south, east, and west eyewall, respectively. We deployed additional sondes in the southern, eastern and western eyewall, one in the western outer eyewall at 2356 UTC before climbing back up to ~20,000 ft to resume the rest of the synoptic mission. Unfortunately most of the sondes in the eyewall were full or partial failures. [Figures 3 and 4](#) show the inner core sonde observations at 925 mb and the surface, respectively. After releasing sondes to the west and southwest of Hurricane Floyd, we landed at Tampa at 0230 UTC. Examples of the observations recorded from the GPS sondes from N42RF and N49RF at 500 mb, 850 mb, and the surface are in [Figures 5, 6, and 7](#), respectively.

Evaluation:

The two aircraft, tasked (NHC) synoptic-surveillance mission provided important information from both the periphery and inner core regions of an intense Hurricane Floyd. The flights were conducted one to two days before a potential landfall along the Florida coast or in the southeast states. The radar and GPS sonde data should be useful in continuing studies of the hurricane eyewall and rainbands. The SFMR data again will be useful for surface wind speed estimates, especially considering the high failure rate of the GPS sondes.

Problems:

N42RF released 26 dropsondes, transmitted 19, and had 7 full or partial failures, a much higher-than-normal failure rate. This high failure rate is being investigated by HRD and engineers at AOC to arrive at a solution. The radar and data systems performed flawlessly.

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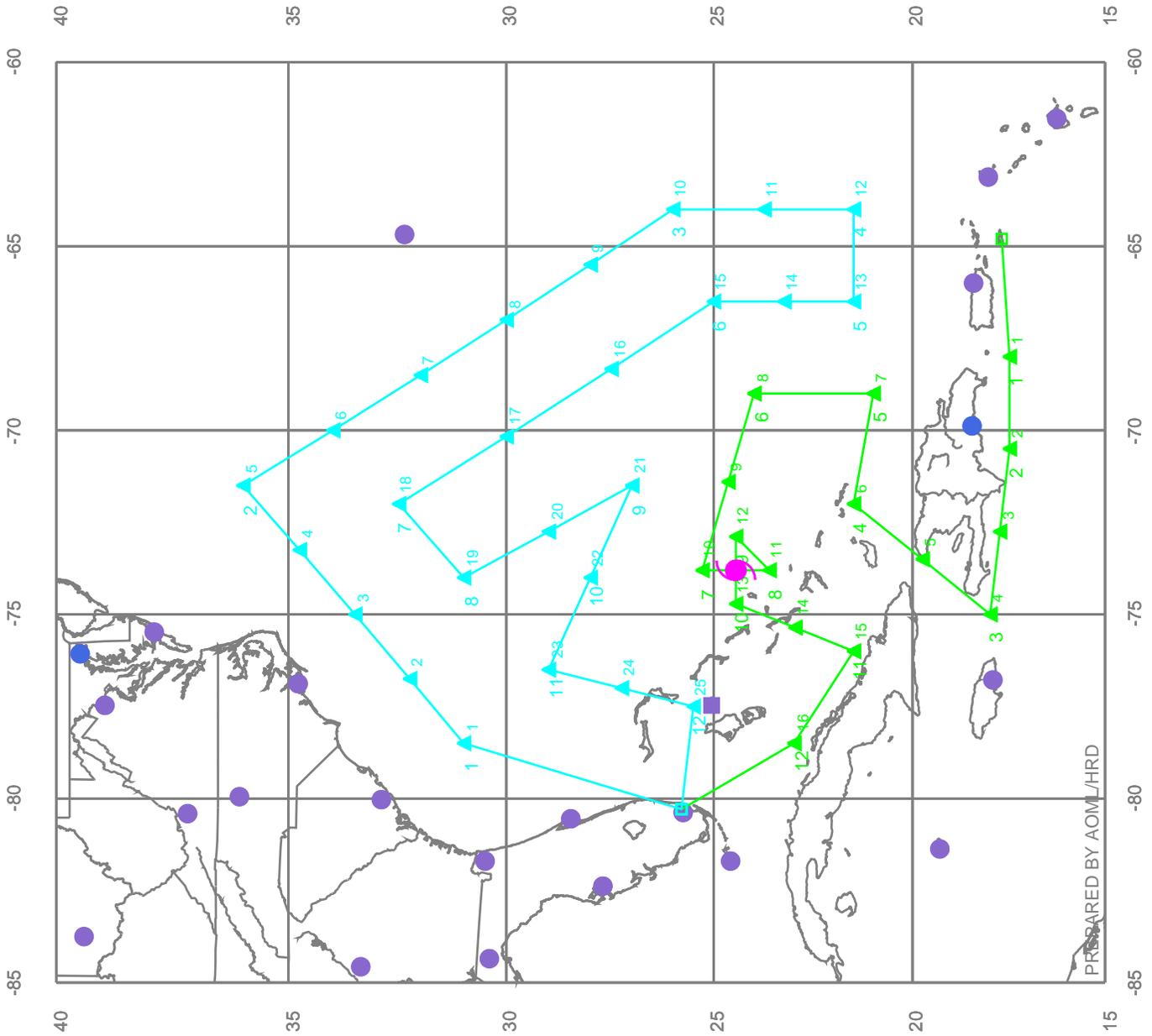
FLIGHT TRACKS
FLOYD/SYNOPTIC

- 990913hp.ftk
- 990913np.ftk

RAWINSONDES 9809

- Regular
- 12Z only
- 00Z only
- Infrequent
- Infrequent - 00Z
- Infrequent - 12Z

Figure 1



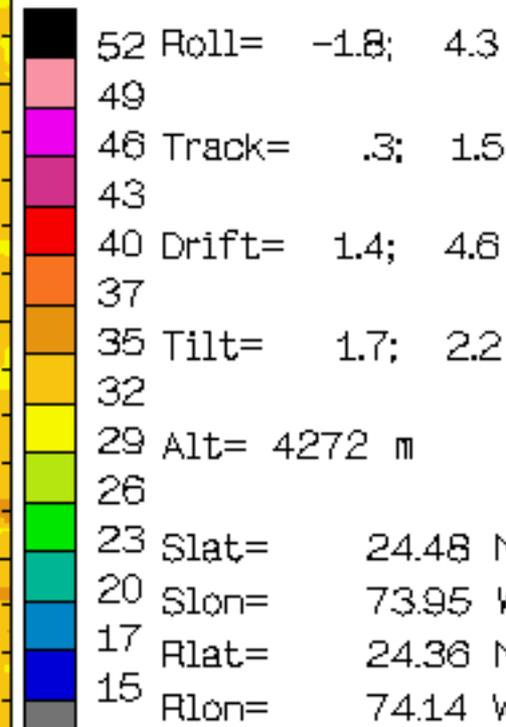
990913h1

FLOYD

Figure 2

(min.) (max.)

Pitch= 1.3; 2.3



dBZ

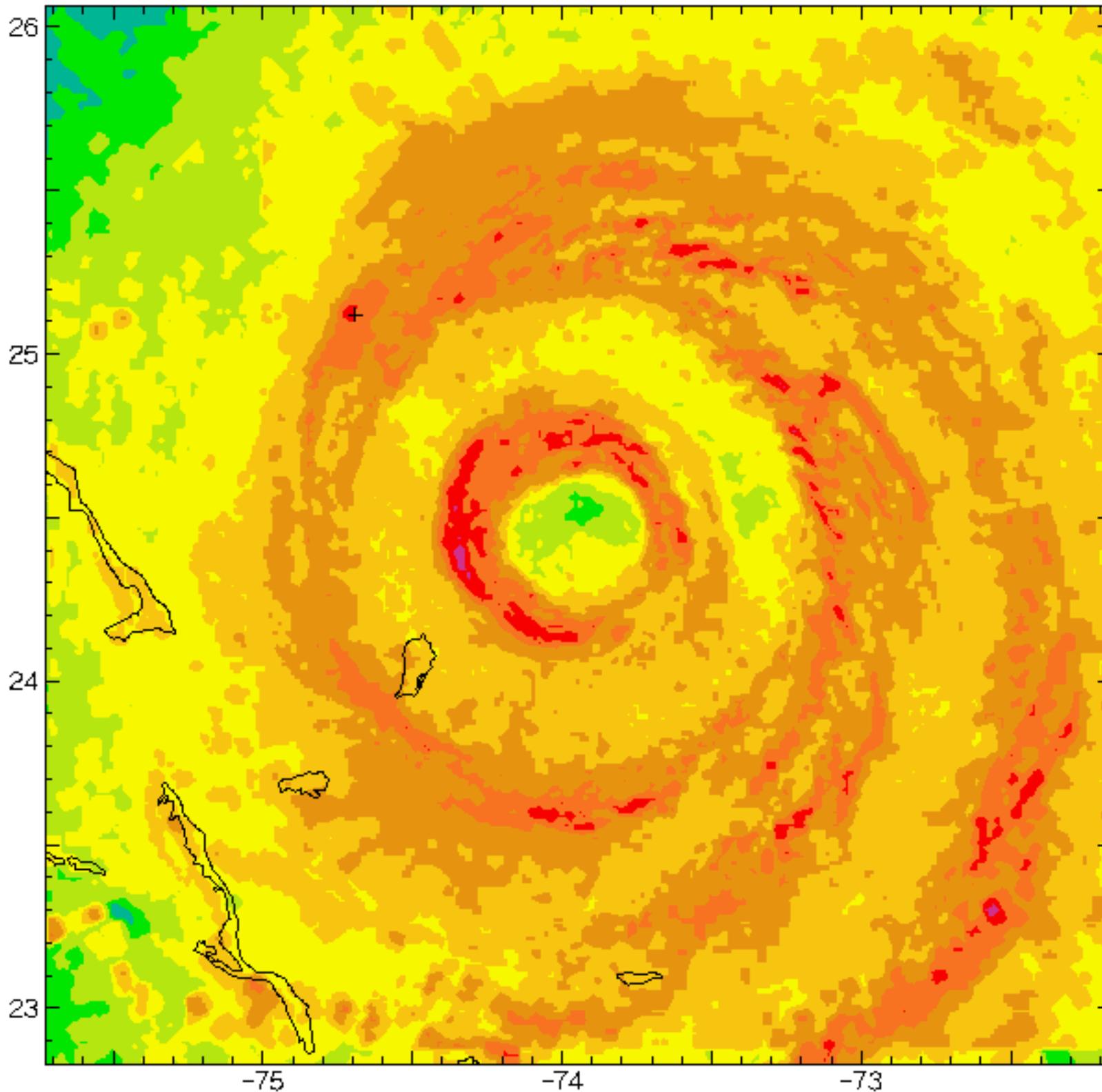
234146 Z

Lower Fuselage

360 X 360 km

produced by

HRD / AOC



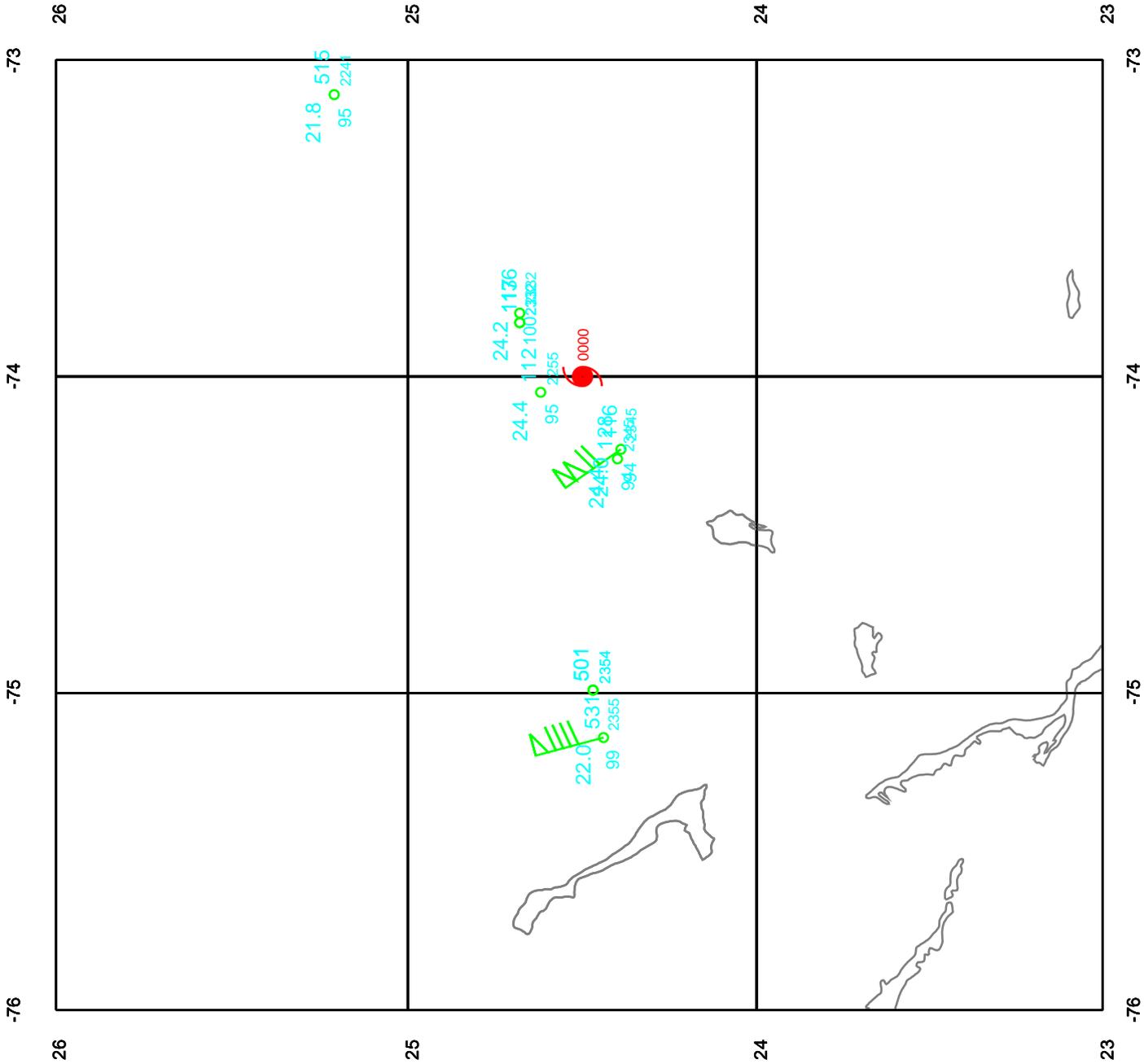
FLOYD

925 mb

Date: 990913

Time: 18-30 UTC

Figure 3



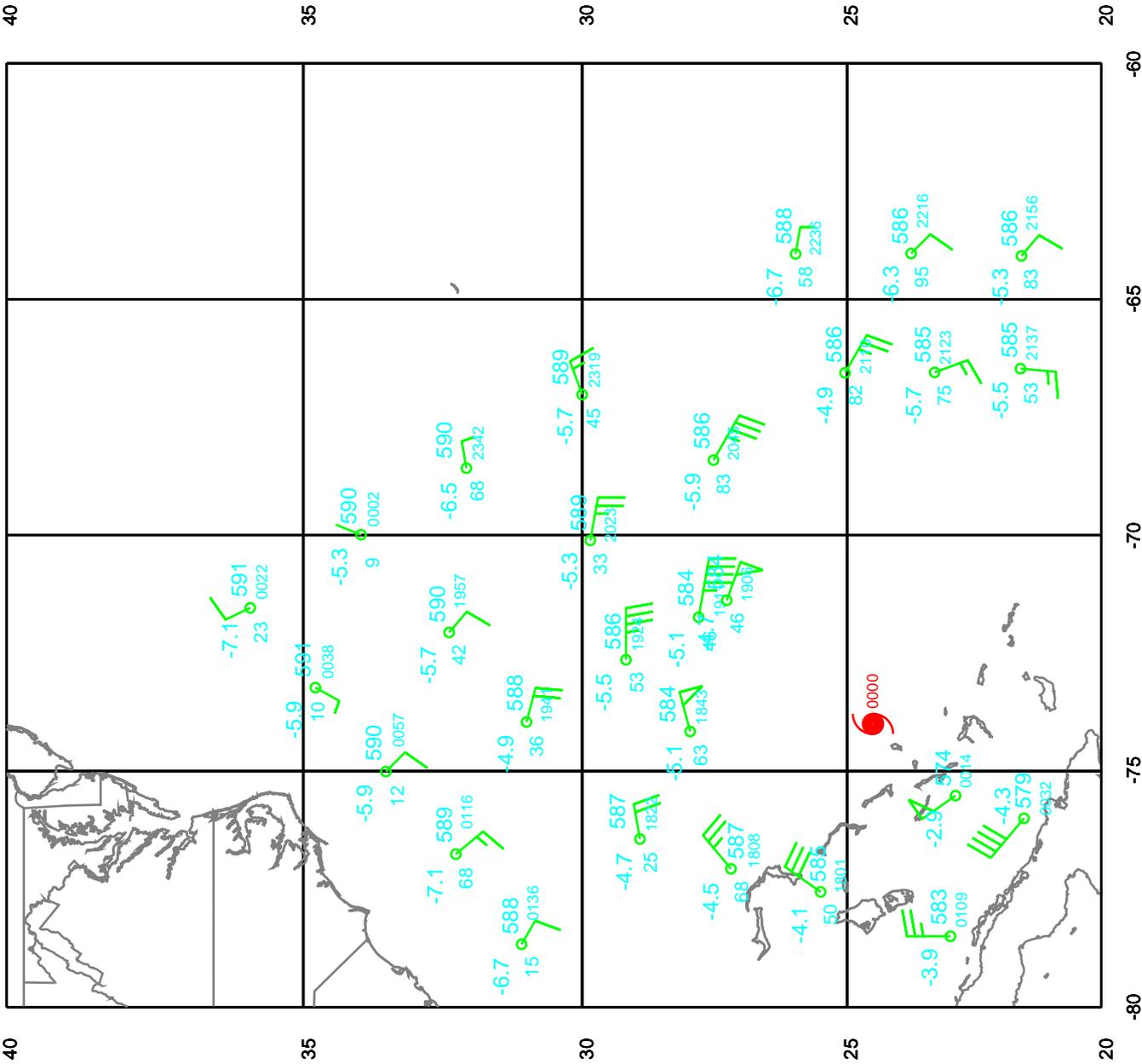
EARTH RELATIVE

FLOYD

500 mb

Date: 990913

Time: 18-30 UTC



FLOYD

850 mb

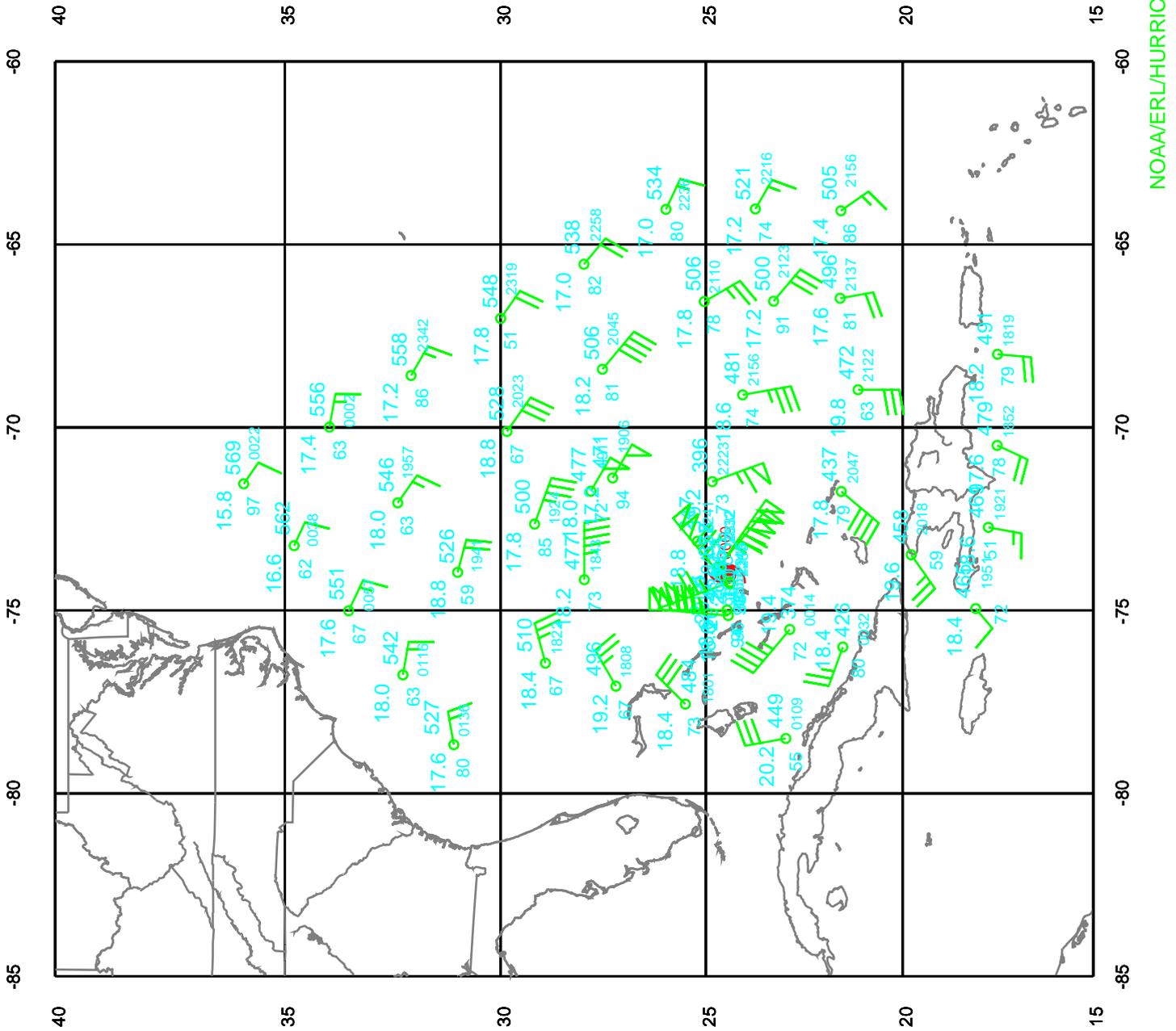
Date: 990913

Time: 18-30 UTC

Figure 6

EARTH RELATIVE

NOAA/NERL/HURRICANE RESEARCH DIVISION

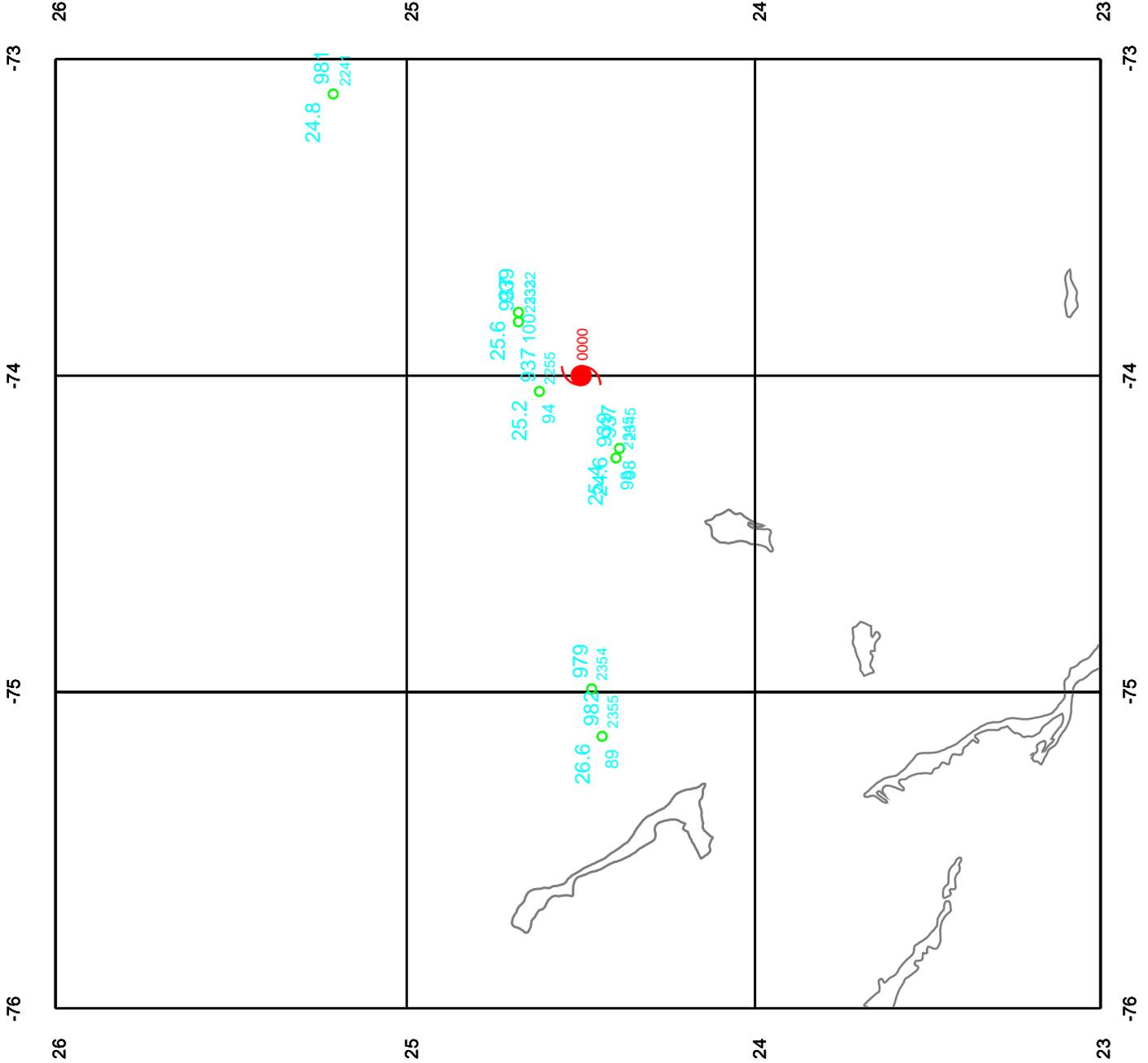


FLOYD

Surface

Date: 990913
Time: 18-30 UTC

Figure 7



EARTH RELATIVE